REMARKS/ARGUMENTS

The Examiner has objected to the Amendment filed on September 22, 2005 on the basis that it introduces new matter into the disclosure. The Examiner alleges that the language "a pressure wave that travels through said pressure vessel at sonic velocity", as recited in claims 1 and 13, is not supported by the original disclosure. For the reasons set forth herein, it is submitted that the Examiner is in error in this conclusion.

There is submitted herewith the Declaration of Inventor, James Michael Rose. The Examiner's attention is directed to paragraphs 6, 7 and 8 of the Declaration wherein it is stated that the recitation of the pressure wave traveling at sonic velocity is supported by the disclosure in pages 5 and 6 of the specification, as well as in Figs. 3 and 4 of the drawings of the above-identified application. A person skilled in this particular art would readily understand from the equations or formulas in "Elements of Gasdynamics" and in "The Dynamics and Thermodynamics of Compressible Fluid Flow, Vol. 2", set forth on pages 5 and 6 of the specification and the schematic views in Figs. 3 and 4 of the drawings, that the pressure wave travels through the pressure vessel at sonic velocity. As stated in the Declaration, the equations or formulas on pages 5 and 6 of the specification use sonic wave velocities (waves propagating at the speed of sound) in the development thereof, and "C" in Figs. 3 and 4 of the drawings is the velocity of sound and is the definition of sonic velocity.

It is requested, therefore, that the Examiner reconsider and withdraw the objection to the recitation of sonic velocity as being new matter that is not supported by original disclosure in this application.

Claims 1-5, 8-10, 12, 13-18 stand rejected under 35 U.S.C. 102(b) as being anticipated by Rink et al. (U.S. 5,964,479). Claims 6 and 7 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Rink et al. in view of Starozihitsky et al. (U.S. 6,364,355); and claim 11 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Rink et al. in view of Green et al. (U.S. 6,286,864).

For the reasons set forth hereinafter, it is submitted that claims 1-18, as presented herein, are not anticipated or rendered obvious by the teachings of Rink et al., taken alone or in combination with the other cited references.

Claims 1 and 13, and all of the claims depending therefrom recite that the second predetermined pressure is sufficient to create a pressure wave that travels through the pressure vessel at sonic velocity, and the manifold rupture disk is directly exposed to the interior of the pressure vessel in the path of the pressure wave so that, upon the firing of the micro gas generator or initiator, the gas pressure in the initiator housing increases to or exceeds the second predetermined pressure to rupture the initiator rupture disk and create the pressure wave that travels through the pressure vessel to impinge on the manifold rupture disc and create a localized pressure at the manifold rupture disk that equals or exceeds the third predetermined pressure to rupture the manifold rupture disk and allow flow of gas through the manifold before the gas in the pressure vessel is significantly heated and pressurized by the gas flow from the initiator housing.

As stated in the specification, the rupture of the manifold disk by the pressure wave before the gas mixture in the pressure vessel is significantly heated and pressurized by the gas flowing through the initiator disk allows cool, pressurized gas to enter the manifold and the

device to be inflated or pressurized. This is particularly advantageous in the case of an airbag where a cooler inflation gas provides for a maximum up time for rollover events and the like.

The teachings of Rink et al. fail to anticipate or to render obvious the novel recitations in Claims 1-18 as presented herein. First, there is no disclosure in Rink et al. of a creation of a pressure wave that travels through the pressure vessel at sonic velocity to create a localized pressure at the manifold rupture disk to rupture it and allow flow of gas through the manifold before the gas in the pressure vessel is significantly heated and pressurized by the gas flow from the initiator housing. The Examiner's attention is directed to the following portion of the specification of Rink et al. at Column 9, lines 56-67:

> The passage of the reaction products into the gas storage chamber 312 serves to increase both the temperature and the relative amount of gaseous products within the gas storage chamber. Operation of the inflator assembly 310 is thereafter generally similar to that of inflator assembly 210 described above. Specifically when the gas pressure within the gas storage chamber 312 exceeds the structural capability of the burst disc 3344, the disc ruptures or otherwise permits the passage of the heated and hence expanded stored gas as well as reaction products or other material passed into the gas storage chamber 312 from the reaction chamber 313 into the associated airbag.

It is apparent, therefore, that the acetylene-based airbag inflator of Rink et al. does not create a pressure wave that creates a localized pressure at the manifold rupture disk to rupture it and allow flow of gas through the manifold before the gas in the pressure vessel is significantly heated and pressurized by the gas flow from the initiator housing, as specifically recited in Claims 1-18 as amended herein.

Even if a pressure wave were created by the inflator of Rink et al., it would not create a localized pressure at the manifold rupture disk to rupture it before the gas in the pressure vessel is significantly heated and pressurized for the reason that the manifold rupture disk of Rink et al. is covered by a throttle portion, 30, 230 or 330 that prevents a pressure wave from impinging on the manifold rupture disk. In contrast, all of Claims 1-18, as presented herein, recite that the manifold rupture disk is directly exposed to the interior of the pressure vessel in the path of the pressure wave so that the pressure wave can travel through the pressure vessel to impinge on the manifold rupture disk and create the localized pressure at the manifold rupture disk to rupture it before the gas in the pressure vessel is significantly heated and pressurized. Accordingly, all of Claims 1-18 should be allowable over the teachings of Rink et al.

The conclusions and arguments submitted herein with respect to the Rink et al. reference are supported by the paragraphs 9-12 of the Declaration of Inventor, James Michael Rose, submitted herewith. As set forth in the Declaration, the acetylene-based airbag inflator of Rink et al. does not create a pressure wave that creates a localized pressure at the manifold rupture disk to rupture it and allow flow of gas through the manifold before the gas in the pressure vessel is significantly heated and pressurized by the gas flow from the initiator housing. In Rink et al. the manifold rupture disk is covered by a throttle portion 30, 230 or 330 that prevents a pressure wave from impinging on the manifold rupture disk. Accordingly, the formation of a localized high pressure on the rupture disk of Rink et al. is precluded by the throttle portion covering the manifold rupture disk.

Also, because of its construction, the acetylene-based airbag inflator of Rink et al. cannot function in the same manner as the gas generator of the present invention wherein the manifold rupture disk is directly exposed to the interior of the pressure vessel in the path of the pressure

wave so that the pressure wave can travel through the pressure vessel to impinge on the manifold rupture disk and create a localized pressure at the manifold rupture disk to rupture it before gas in the pressure vessel is significantly heated and pressurized.

Claims 6 and 7 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Rink et al. in view of Starozhitsky et al. (U.S. 6364355). The secondary reference was cited for its teaching of a pressure vessel formed of a lightweight high strength material, such as low carbon steel. Other than this disclosure, Starozhitsky et al. fails to add anything of significance to the teachings of Rink et al. with respect to the novel recitations in Claims 1-18, as presented herein. Accordingly, Claims 6 and 7 should be allowable over the combined teachings of these references.

Claim 11 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Rink et al. in view of Green et al. (U.S. 6286864). The secondary reference to Green et al. was cited for its disclosure of a manifold constructed to provide for radial or axial flow therefrom. Other than this limited disclosure, Green et al. fails to add anything of significance to the teachings of Rink et al. with respect to the novel recitations in Claims 1-18 as presented herein. Accordingly, Claim 11 should be allowable over the combined teachings of these references.

In view of the above amendments and remarks, it is submitted that Claims 1-18, as submitted herein, are allowable to Applicants, and formal allowance thereof is earnestly solicited.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: Frank P. Presta

Frank P. Presta
Reg. No. 19,828

FPP:lcb
901 North Glebe Road, 11th Floor
Arlington, VA 22203-1808
Telephone: (703) 816-4000
Facsimile: (703) 816-4100